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Author:
Bedaux company, inc.,
New York
Title:
Bedaux labor
measurement
Place:
[New York]
Date:
[1928]

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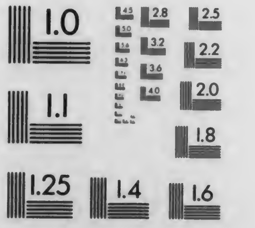

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Time Study

BEDAUX MEASURES LABOR

THE CHAS. E. BEDAUX COMPANY
OF NEW YORK, INCORPORATED
271 MADISON AVENUE, NEW YORK
DOUGLAS S. KEOGH, President

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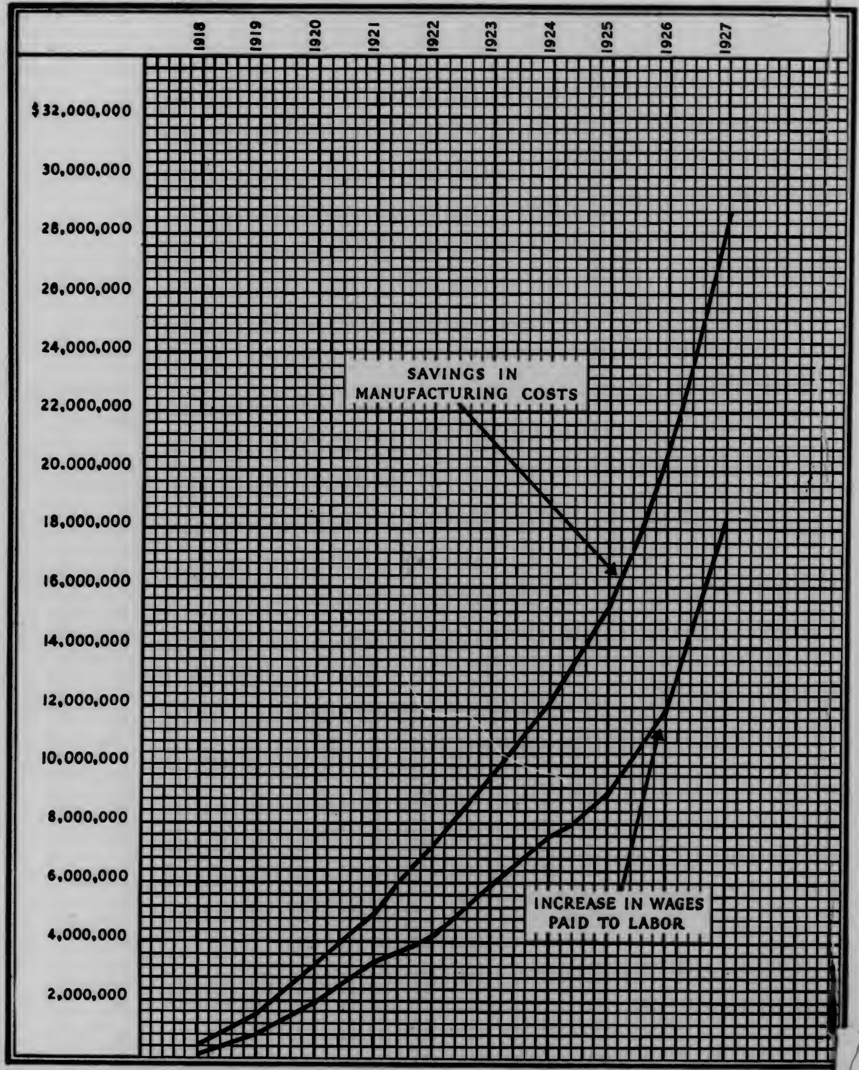
BEDAUX
LABOR MEASUREMENT

THE
BEDAUX
PRINCIPLE
OF HUMAN POWER
MEASUREMENT IS
THAT ALL HUMAN
EFFORT IS MEASURABLE IN TERMS OF
A COMMON UNIT
MADE UP OF EFFORT
AND RELAXATION
IN PROPORTIONS
GOVERNED BY LAWS
CONTROLLING STRAIN

Business
D230
B396

TEN YEARS' CONTRIBUTION TO INDUSTRY

Cumulative Results from Bedaux Application in More Than 200 Industrial Plants, Involving Over 150,000 Workers.



I.

ORIGIN AND DEFINITION OF THE BEDAUX UNIT

UNDERLYING the problem of effective utilization and equitable remuneration of labor in any industry is the problem of proper measurement of labor.

Bedaux measurement of labor is based on the principle that all human effort may be measured in terms of a common unit, that unit being made up of a combination of work and rest, with the proportions dependent upon the nature of the effort and the subsequent relaxation required to compensate for it. As tasks vary, the ratio of work to rest within the unit varies, but the unit itself remains constant.

This unit is the Bedaux Unit of Human Power Measurement, and takes its name from the originator, Chas. E. Bedaux. For the sake of convenience, the Bedaux unit is called a *B*. In general terms, the *B* may be described as the amount of work a normal man would do in one minute when working at a normal rate of speed under ordinary conditions, and availing himself of his full measure of relaxation.

Years ago, Mr. Bedaux became impressed by the need of a means of measurement that would render it possible to set quantitative values on human physical effort.

Successive theories were tested and rejected until the correct basis was found in the relation of bodily strain to effort under any given set of conditions.

This was in 1911. The following five years were devoted to building up relaxation values applicable to expenditure of effort under varied conditions. Careful study was made of the handling of different weights in varied positions, using different members of the body, particularly in conjunction with the relative sequence of motions and the frequency of their repetition.

Then Mr. Bedaux established his unit, a combination of work and rest, which is defined as follows:

> "The Bedaux Unit, or *B*, is a fraction of a minute of work plus a fraction of a minute of rest, always aggregating unity, but varying in proportions according to the nature of the strain."

By means of this unit, it is possible to combine given expenditures of effort with their corresponding relaxation allowances and arrive at figures that are directly comparable. The productive capacity varies with each human being, but the average power of a large group remains constant through successive generations, variation in productivity being due to differences in facilities and not in men.

A *B* is not a minute of working time, but a minute in which work and compensating relaxation are combined in the proper proportions. In one extreme case it may be ⅓ of a minute of work and ⅔ of a minute of rest, and in another case 9/10 of a minute of work and 1/10 of a minute of rest, but the amount of effective effort in the two cases is the same.

Task No. 1 might have a cycle time of 1.2 seconds and be of such nature as to require a 150% allowance for relaxation. Then the effort value of Task No. 1 equals .05 *Bs*.

$$\left(\frac{1.2 \text{ seconds work} + 1.8 \text{ seconds rest}}{60} = .05\ \textit{Bs.}\right)$$

Task No. 2 might have a cycle time of 4 minutes and be of such nature as to require a 30% allowance for relaxation. Then the effort value of Task No. 2 equals 5.2 *Bs*.

$$(4 \text{ minutes work} + 1.2 \text{ minutes rest} = 5.2\ \textit{Bs.})$$

A production of 1560 pieces an hour for Task No. 1 would represent 1560 x .05 *Bs* = 78 *Bs* an hour. An equal amount of effective effort on Task No. 2 would produce 15 pieces an hour, since 15 x 5.2 *Bs* likewise equals 78 *Bs* per hour. If but 14 pieces an hour are produced, then the effective effort has been less, because either misdirected or not expended. (14 x 5.2 *Bs* = 72.8 *Bs* per hour.)

The *B* is based upon human energy and time. It is independent of type of manufacture, product, individuals or money values. It has been successfully applied to diversified industries in different countries with different races and different climates.

NOTE: The "American Machinist" in its issue of February 16, 1922, published an article by the Managing Editor, L. C. Morrow, under the heading—"The Bedaux Principle of Human Power Measurement."

His explanation is as applicable today as when published, and for those interested in a more technical discussion, that part of Mr. Morrow's article dealing with the Bedaux unit itself is given for reference in the back of this booklet. (See page 15.)

II.

APPLICATION OF BEDAUX MEASUREMENT

THE work of the various Bedaux companies of today is a specialized service involving practical application of Bedaux measurement and practical instruction in the use of that measurement for solution of many industrial problems.

Every task involves a definite amount of effort which may be measured in Bedaux units, or *Bs*, and, irrespective of the number of dissimilar tasks he may have been engaged upon, an individual's performance is directly measurable through the total *Bs* produced.

At the end of the day the average number of *Bs* per hour unfailingly registers the effectiveness with which his time and effort were utilized. If additional work has been made necessary by defective material or a machine out of order, his effectiveness is lowered. Lost time waiting for assignment, etc., has the same result, and all such losses now become directly measurable.

Highly paid mechanics and lower paid laborers, men and women, so-called direct and indirect workers—the performance of all is measured by the same universal "yardstick," reducing all labor to a common denominator.

Departmental performance is but the total of individual performances, and departments are totalled to show plant performance. Comparative results are on the same basis throughout, and endure year after year, unaffected by changes in wages, sales, prices, product or personnel.

Bedaux measurement is to be regarded as a highly useful tool, put to practical use in the solution of practical problems related to industrial control. Some of these problems and the effects of Bedaux application are indicated below:

1. DEGREE OF UTILIZATION OF LABOR

Comparison of actual output with measured capacity to produce discloses misdirected or unutilized efforts that represent losses. Under Bedaux measurement, the average number of Bedaux units, or *Bs*, per hour, is a direct measure of effective effort.

It has been found from years of actual experience that, under Bedaux incentive and control, 80 to 85 *Bs* per hour may be expected. Less than 80 *Bs* an hour indicates incomplete use of labor and incomplete realization of maximum earning power.

2. ADEQUATE AND PROTECTIVE REMUNERATION

Under the Bedaux method of wage payment, a basic hourly rate is established in relation to requirements of skill, experience and responsibility. In return for this basic hourly wage, a definite amount of work is expected, namely, 60 *Bs* an hour.

The amount of work required to perform an operation remains unchanged except as the operation itself changes, and, therefore, the *Bs* credited for that operation are guaranteed against change as long as the method remains the same. The employer is assured a definite amount of work in return for the wages paid, while the employee is assured a fixed amount of work asked in return for his basic wage.

The employer may adjust base rates throughout the plant when necessary to meet general changes in wage levels. The employee recognizes the security in a consistent scale of hourly rates uninfluenced by individual earnings.

3. CONTROL OF COSTS

The labor necessary to perform an operation correctly under normal conditions is represented by the number of *Bs* established as the effort value of that operation. This value in *Bs*, multiplied by the standard cost per *B* as determined by the corresponding base rate, fixes the standard cost of the operation.

Idle time, performance below standard, correction of defective work, skilled operators used on unskilled work — such wastes and losses are automatically disclosed in accounting for the difference between standard and actual costs. Bedaux analysis, therefore, goes beyond mere cost finding to active cost control.

4. EFFECTIVE ASSIGNMENT OF LABOR

Ineffective effort is an economic loss that affects both employer and employee.

It is common experience to find men and women engaged in work for which they are obviously unfitted. A slow-thinking individual struggles to master the operation of a high-speed, complex machine, while a quick, nervous individual struggles against monotony in serving a slow-moving conveyor. Thick, strong fingers fumble for rivets, while slender, sensitive hands move packing cases.

"Bedaux" not only serves to discover misplaced individuals, but is a direct agent in placing the right man on the right job.

5. IMPROVED INDUSTRIAL RELATIONS

A fixed value for a given amount of effort removes an age-old source of contention.

The spirit of co-operation created by Bedaux is founded on mutual confidence. Workers are used for Bedaux time-study in order that the other workers may know exactly how it is done and why. Their confidence is won in the fairness and accuracy of the *B* values established, and is retained through assurance that these *B* values are secure against revision as long as the method or process remains the same.

The workers learn that base rates are established on jobs and not on individuals. They derive a sense of security from the knowledge that individual rates are not subject to revision and that a change in the base rate of an entire group would throw out of balance the entire scale of rates throughout the plant.

6. PRODUCTION CONTROL

The productive capacity of a department may be gauged accurately and positively.

Fifty operators, averaging 80 *Bs* an hour, will produce in a 45-hour week a total of 180,000 *Bs*. It does not matter if orders are shifted to run a different model, or the product changed altogether. A production of 180,000 *Bs* may be expected, and knowing the *Bs* required to make the new item, the quantity that can be produced is known immediately.

Where expansion or curtailment of production is necessary, the corresponding adjustment in working force becomes simple arithmetic.

7. DISTRIBUTION OF BURDEN

The *B* is independent of fluctuation in hours and money. In the 50-man department just cited, the amount of overhead expense to be distributed is divided by 180,000 to determine the burden charge per *B*.

Trained workers may leave and be replaced by less experienced help, so that 60 operators instead of 50 are required to get out the production. The amount of burden absorbed remains correct, however, and is not inflated, as is the case when distribution is made on the basis of labor hours. Wage levels may be reduced, or male operators replaced by cheaper female operators; the amount of burden absorbed again remains unaffected, and is not insufficient, as is the case when labor costs are used as the basis of distribution.

III.

BEDAUX AS IT AFFECTS WAGES

EARNINGS, to be equitable, must properly recognize two variable factors:

1. Skill, experience and responsibility required.
2. Amount of effort expended.

The Bedaux base rate covers the first point. It is established after analysis of all qualifications required for the job as a fair hourly wage for that particular class of work.

Bedaux premium covers the second point. A normal output is expected in return for the basic hourly rate, and a premium is paid for all additional output.

The normal day's work (an average output of 60 *Bs* an hour) is the same for every individual, regardless of race, sex, occupation or wage level. The basic day's wage (hours worked multiplied by the Bedaux base rate) is fixed for each particular class of work in accordance with the nature of that work and the relative value of labor in the community.

Additional pay is given for additional effort and the amount of this added effort is definitely measured, so that no individual is unequally rewarded and thereby induced either to draw too heavily on his surplus energy or allow it to remain unused altogether. Overdraft against reserve energy means ultimate loss of effectiveness, and unutilized ability means restricted earnings. Both are opposed to industrial growth and stability.

Bs produced in excess of 60 per hour are termed "Premium *Bs*". The money value of these "Premium *Bs*" is equal to the base rate divided by 60, and is distributed as follows: 75% to the direct workers and 25% to those whose cooperation the direct workers must have in order to produce the high *B*-hours that bring increased earnings. (For convenience, the term *B*-hour is used to designate "number of *Bs* per hour.")

A Premium *B* thus has a value to the direct worker that is 75% of the full value of each of the 60 *Bs* of standard performance. The remaining 25% is charged against a premium reserve from which the premium to supervising and indirect workers is paid as it is earned. The cost per *B* thus remains constant, and the premium to indirect workers is paid out of economies which their own efforts so largely make possible.

Supervisors and indirect workers are likewise paid base rates corresponding to their particular activities. They are rewarded either on their own individual performance, or, if their duties involve general service to the direct workers, then upon their own *B*-hour together with results of their efforts as reflected by the average *B*-hour of the department and the successful elimination of those losses that lie within their control.

IV.

RESULTS OF BEDAUX APPLICATION

PREVIOUS mention has been made that an average of 80 to 85 *Bs* an hour has been found obtainable under Bedaux methods of control and incentive. This is not theory based upon anything inherent in the Bedaux unit itself, but practical results quoted from actual experience of many years in many plants.

It is not uncommon to find well-managed plants with well-organized facilities, and with labor working under some incentive system, producing 45 to 50 *Bs* an hour. The difference between 50 *Bs* an hour and 80 *Bs* an hour represents unused capacity to produce, recognizable only when disclosed by actual measurement of the labor involved.

This "unused capacity to produce" is converted into useful work with resulting economies that go into savings for the employer and increased earnings for the employees. Bedaux control and incentive yields immediate returns, since practical results are forthcoming within three or four weeks of its application to the first department. The entire cost of application is frequently covered in a few months.

The results of Bedaux applications in over 200 plants in different industries during the last eleven years have been an increase in production of 44%, accompanied by an average reduction in labor costs of 20%, and an increase in labor earnings of 15%. These results were obtained without any expense whatever for plant alterations or purchases of new equipment.

The steady and uninterrupted growth of the Bedaux organization and the widespread application of the Bedaux methods of measurement and control afford convincing evidence of the soundness of Bedaux principles and of their practical value to industry, as the following figures show:

Year	*Number of Bedaux Companies*	*Number of Engineers Employed*	*Plants Using Bedaux*	*Plants Under Application*	*Total Plants*
1918	1	2	1	2	3
1924	2	19	70	15	85
1926	4	41	110	35	145
1928	7	94	161	72	233

The wide scope of Bedaux applications is shown in the list of products affected, which is included in the appendix on page 18.

V.

METHOD OF PROCEDURE

THE actual application of Bedaux involves no sweeping changes creating uncertainty and confusion within the client's organization. The Bedaux engineer goes into the plant and adapts Bedaux measurement, control and wage payment to conditions as he finds them. He utilizes existing clerical facilities and adapts to his needs such forms as are already in current use.

Physical layouts are not changed and there is no interference with existing methods and processes. Bedaux measures the effectiveness with which labor is used in connection with existing facilities.

The Bedaux engineer is a student of human nature, with a sympathetic understanding of the worker's point of view. From the day he enters a new plant, he strives to win the confidence of the workers and enable them to understand what he is doing and his purpose in doing it. He brings them to see both the protective nature of Bedaux measurement and the opportunity thus presented to have individual ability and diligence definitely recognized and adequately rewarded. Understanding and enthusiasm are built up in advance of actual application.

As soon as Bedaux has been applied to one department or group of workers, a daily posting sheet shows for each individual the number of *B*s produced the preceding day, the resulting *B*-hour, and the amount of premium earned. This sheet appeals to the worker's pride. He sees himself of enough importance for his individual performance to be recorded daily. He watches the performance of others and enters into friendly competition with his fellow workers.

The worker takes a new interest in his daily routine. His record speaks for itself as compared with that of a less competent neighbor, and he has opportunity to prove his fitness for promotion. In times of low production and layoff, the better workmen are retained. Prejudices are defeated and favoritism balked.

The engineer co-operates with the client's organization to educate supervision to make effective use of Bedaux analysis and control in eliminating conditions that result in retarded production, excess cost and restricted earnings. The client's organization is carefully trained to carry on the work successfully and make use of the means for industrial control that has been provided.

Wherever practical, group payment is avoided. Its only advantage lies in increased simplicity, for experience has proved that individual productivity varies inversely with the number of operators in a group. Man instinctively seeks to distinguish himself, and his interest is defeated by submergence in a group where the best is undistinguished from the worst.

All lost time beyond the operator's control is credited to him and paid for at his base rate. The operator is not called upon to make up this lost time by exerting additional speed and effort. He does lose the opportunity to earn a premium during such idle time and this causes him to dislike lost time as keenly as does the management.

The client's organization is trained to establish *B* values and to carry on the Bedaux work successfully after the Bedaux engineer has left the plant.

VI.

SERVICE TO BEDAUX CLIENTS

THE work of the Bedaux staff is a specialized service, as already stated, involving practical application of Bedaux labor measurement and practical instruction in the use of that measurement.

A thoroughly practical "tool" is placed at the disposal of the factory organization, and the results obtained are largely proportional to the thoroughness and ability with which this "tool" is used.

Salvaging of unfortunately managed plants is not the mission of the Bedaux organization, and Bedaux clients are, for the most part, drawn from among the soundest, most capably-managed concerns.

The Bedaux organization is divided into separate operating companies to afford flexibility and insure close individual attention to the problems of each client. Each company operates within an area that can be served promptly and adequately. The practice of all Bedaux companies is co-ordinated through control by a central organization under the presidency and active direction of the founder, Chas. E. Bedaux.

This central organization, International Bedaux Company, Incorporated, maintains and operates a research department and acts in the capacity of technical counsel. Thus each individual engineer of any Bedaux company has behind him the resources and experience of the combined organization. The creator of Bedaux labor measurement continues to control the fundamental principles and practices governing its practical application and at the same time promotes and encourages individual initiative.

The Bedaux staff is composed of highly paid, experienced, graduate engineers, selected from hundreds of applicants, and thoroughly trained for their particular work. One of these engineers is assigned to a client's plant, as previously mentioned, and devotes his entire time and attention to the application, under close supervision and with the effective assistance of the entire Bedaux organization.

Bedaux services are invariably on an hourly basis, with a flat rate per hour for the hours actually spent in the plant. This is the only fee. There are no additional charges for traveling expenses or services of the central office. Contracts are refused, so that a client is free to discontinue these services at any time.

In the course of regular application work, clients permit access to many secret processes and carefully guarded methods of manufacture, with a knowledge that their interests will be scrupulously protected. The Bedaux organization does not concern itself with equipment, physical layouts or manufacturing methods,

and Bedaux engineers are under formal contract not to disclose information that comes to them in the course of their work, and neither to seek nor accept employment from competitors of a client in whose plant they have worked, in the event of their leaving the Bedaux staff.

It may seem to some that Bedaux engineers fail to fulfill their obligation as consultants, in those cases where they study the labor utilization in a manufacturing process without comment, knowing that a superior process exists. But, in so doing, they are respecting the confidence which other Bedaux clients have placed in them.

The Bedaux field is labor measurement, and the Bedaux organization remains within that field.

APPENDIX

EXTRACT from Article in "American Machinist" issue of February 16, 1922, by L. C. Morrow, Managing Editor.

"The principle and system exist as the result of Mr. Bedaux' attempts to supply a substitute for the usual time-study methods which he became convinced were possessed of inherent weaknesses, in that they lacked a standard of measurement for labor, considered only the actual time to perform an operation, and did not take account of the nature of the strain on the human body. This conclusion was formed during the first several years that Mr. Bedaux spent in America, where he had come from France. He worked at many jobs, some among them bringing him into contact with time-study methods, affording the knowledge of tremendous waste in industry, and proving the existence of the field for the industrialist, or industrial engineer. He eventually engaged in time-study and efficiency work, returning for a time to France to practice.

"His experience as a whole led him to believe that no matter how carefully a time-study is made, there is almost certain to be an inequality of values—some will have soft jobs, some will have better machines, some will fail because of fault of management. These observations led to the belief that man should be considered as a force, renewed by rest, food and thought; that the force is spent in certain elementary performances, lifting, pulling, pushing, pressing; and that the nature of a movement and the frequency of its repetition determine the amount by which the force is drawn upon. The result of these beliefs was an attempt to determine the elementary motions employed by man in working, and the rest periods related to them, so that the values ascertained could be used as a basis in all time-study work.

"To concretely express his conclusions, reached in this manner, and strengthened by experiment, Mr. Bedaux (in 1911) formulated a law:

> 'For muscular effort of a given power the ratio of strain is directly proportional to the rapidity of motion and completion of the cycle.'

And a corollary:

> 'Rapidity of motion is inversely proportional to weight handled, pressure applied and length of cycle.'

"For example, to illustrate the law, wrapping a box of safety matches in light-weight paper would require only slight muscular effort and the motion and the completion of the cycle would be of great rapidity. The ratio of strain would be great. Wrapping a two-foot cube box weighing forty pounds in heavy tarred paper would require great muscular effort and the motion and the completion of the cycle would be of low rapidity. The strain would be relatively slight. The corollary may be applied to the same example.

"The first law and its corollary were later supplemented by a second law:

> 'For a muscular effort of a given power the duration of work and rest periods is inversely proportional to the rapidity of motion.'

"Reverting to the example of the wrapping of the two boxes, the second law means that since the rapidity of motion in wrapping the matches is great, the work and rest periods should be short, while they should be long for the operation of wrapping the large heavy box.

"The application of these laws to time-study was, of course, the embodiment of the consideration of strain. The results seemed to the originator of the laws to reduce to such an extent the inequalities in values that he began to standardize his data by building up a curve showing the rest or relaxation times that should be considered as necessary to offset working times, the whole based on the length of cycle. This curve, begun in 1911 and finished in 1916, is the key part of the present system. It is called the relaxation curve and its limits for relaxation time in proportion to working time are 15 per cent and 210 per cent.

"In practical application the time-studies are quite different from those made in usual time-study practice, both in nature and purpose. They are conducted by practical workmen employed in the departments studied in order to facilitate understanding on the part of all employees of the important part strain plays in the determination of job values. Moreover the time-studies are used merely as a check so far as productive motions are concerned. They do, however, assume considerable importance in the analysis of all that is not strictly productive motion, as they are used in verifying the established strain ratios. It is considered that the form of time-study generally practiced, while it shows inequalities of time in repeated fractions of operations, does not analyze the causes of the inequalities, and, therefore, tends toward erroneous conclusions.

"In applying the system it was found that sequence of motion had a strong bearing upon strain. For example, if a sequence is made up of thirty motions, fifteen of them identical, the strain will be greater if the fifteen identical ones are together than if they alternate with the others. As a consequence there was built up a table of added allowances on the sequence of motion. In the same way another table of allowances was made to take care of the effect upon strain of the position of the body. As an example, strain is greater when performing an operation with the elbow at the height of the shoulder rather than at the height of the waist.

"Once having the capacity to determine the exact nature of the strain, and therefore the exact allowance for relaxation required, the industrialist is in position to arrive at a figure of effort and relaxation combined which becomes comparable in all cases. It is necessary, however, to have a unit of measurement, or in other words to make uniform application. The Bedaux system reduces everything to what could ordinarily be called points, but which the system terms *Bs.*

> 'A *B* is a fraction of a minute of work plus a fraction of a minute of rest, always aggregating unity, but varying in proportions according to the nature of strain.'

"Continuing the example of the simple operations of wrapping the two boxes: If because of the nature of the operation on the wrapping of the small box the allowance for rest must be 160 per cent, the base cycle of performance being one second, the total becomes one second plus 1.6 sec., which equals 2.6 sec., or *B*0.0433 (2.6 divided by 60). And if because of the nature of the operation on the wrapping of the large box, the allowance for relaxation must be 30 per cent, the base cycle of performance being four minutes, the total will be four minutes plus 1.2 min., which equals 5.2 min. or *B*5.2. The two operations should produce in each case a number of pieces such as to make an equal number of *Bs* in a given time. The number of pieces would be in this illustration approximately 13,860 and 115 respectively.

"If in wrapping the small box the operator produces 18,000 pieces in a day of 10 hours, the productive value is 779 *B* (18,000 x 0.0433). As the value of the strain has been determined for the wrapping operations on both boxes, the same or another operator should produce with equal application, skill and strength, a value, in working on the large box, of 779 *B*, or 150 wrapped boxes (779 divided by 5.2). Because of the exact determination of strain in each case, a difference in the quantity of *Bs* produced would indicate a difference in application, in skill, or in strength. . . ."

PRODUCTS AFFECTED

Albums (Photograph)
Automobiles
Baked Goods (Pastry, Cakes, Biscuits)
Balls (Tennis, Rubber, Golf)
Band Instruments
Barometers
Bathing Suits
Batteries (Storage, Dry)
Bearings (Ball and Roller)
Belting (Rubber, Leather, Fabric)
Blackboards
Bleaching (Textiles)
Books and Binders (Looseleaf)
Boots (Rubber)
Boxes (Candy, Cigarette, Drug)
Brake Linings
Brass (Rods, Tubing, Forgings)
Burlap
Cabinet Work (Radios, Sewing Machines)
Cables (Wire)
Cameras
Candy
Canned Products (Milk, Vegetables, Fruit, Meats)
Cans (Metal, Paper)
Carpets
Castings (Grey Iron, Malleable, Brass)
Cases (Jewel and Optical)
Celeron
Celluloid Products
Cereal Foods
Check Protectors
Chemicals
Cigars
Collars
Conveying Machinery
Copper (Wire, Insulated)
Copper (Smelting)
Corsets
Cosmetics
Cotton Goods
Cranes (Bridge and Locomotive)
Doors (Entrance, Interior and Garage)
Drug Sundries (Rubber)
Dumpers (Car)
Dyeing (Textiles)
Elevators
Engraving
Fabrics
Fans (Electric)
Fibre Goods
Files (Steel)
Fittings (Pipe)

Products Affected (Continued)

Fixtures (Electric)
Floor Coverings
Flour
Foods (Prepared)
Forgings (Steel and Brass)
Foundry Work
Frames (Automobile)
Fruits (Canned)
Furniture (Home, School, Church)
Garden Implements
Gears
Generators
Glass (Plate)
Graphite
Hard Rubber Goods
Hardware
Hats (Felt and Straw)
Heaters (Instantaneous)
Hoists (Electric)
Horns (Automobile)
Hose (Garden, Fire, Pneumatic)
Hosiery (Cotton, Silk)
Ignition Systems (Automobile)
Kitchen Cabinets
Kitchenware (Aluminum)
Knitted Garments
Lamp Shades
Lamps (Electric, Arc, Desk, Floor)
Lawn Mowers
Leather
Lenses
Lights (Automobile)
Lighters (Cigar)
Lingerie
Linoleum
Lithography
Lock Washers
Lumber
Machinery (Agricultural)
Machines (Automatic)
Machine Tools
Meats (Packed and Canned)
Mechanical Rubber Goods
Medicines (Patent)
Meters (Electric)
Motors (Electric)
Neckwear
Optical Goods
Organs (Pipe)
Packing House Products (Cattle, Sheep, Hogs)
Paint and Varnishes
Paper
Paper Boxes
Pencils

Products Affected (Continued)

- Photographic Supplies
- Pins and Notions
- Plumbing Supplies
- Printing (Books, Sales Books and Checks)
- Provisions (Cooked Meats, Fruits and Vegetables)
- Pumps (Gasoline)
- Radios
- Razors and Blades
- Rayon
- Refrigerator Cars
- Rugs
- Sash (Steel)
- Saws
- Sewing Machines
- Shirts (Cotton, Flannel, Silk)
- Shoes (Leather, Rubber)
- Shoe Findings
- Soap
- Soups
- Silverware
- Stampings (Steel)
- Starters (Automobile)
- Stoves (Gas)
- Sulphur (Mining)
- Switchboards (Telephone)
- Tanks (Gas)
- Tea
- Telephones
- Textiles (Sheeting, Ducks, Prints)
- Textile Machinery
- Thermometers
- Tires (Automobile)
- Tobacco
- Toilet Preparations
- Tools (Saw, Machine)
- Toys
- Transformers (Electric)
- Transmissions (Automobile)
- Trolleys (I-beam)
- Tubes (Automobile)
- Typewriters
- Valves (Iron, Brass)
- Vegetables (Canned)
- Veneers (Wood)
- Welding Work (Acetylene and Arc)
- Wire
- Woven Goods
- Yarn

THE BEDAUX ORGANIZATION

UNITED STATES

The Chas. E. Bedaux Company of New York,
Incorporated
271 Madison Avenue, New York
Douglas S. Keogh, President

The Chas. E. Bedaux Company of Illinois,
Incorporated
435 N. Michigan Avenue, Chicago
Albert Ramond, President

The Chas. E. Bedaux Company of Pacific States,
Incorporated
Pacific Building, Portland, Oregon
Charles W. English, President

ENGLAND

Chas. E. Bedaux, Limited
Bush House, Aldwych, London
Sir Francis Rose Price, Bart., Chairman

GERMANY

Deutsche Bedaux-Gesellschaft, m.b.H.
Bahnhofstrasse 9, Hannover
Herr Direktor Willy Tischbein, Chairman

ITALY

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Senator Giovanni Agnelli, President

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* * *

The work carried on by The Bedaux Companies is co-ordinated and controlled by

International Bedaux Company
Incorporated
17 Battery Place, New York
Chas. E. Bedaux, President

END OF
TITLE